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not feeding in the spring or summer months.—Mr. H. B. Möschler discusses the systematic position of the genus of zygaenid moths, *Triprocris*.—At the meeting of the Washington Entomological Society for Feb. 11, Mr. Schwarz said that among the many forms of secondary sexual characters in the Coleoptera, some would likely be found to be analogous in function to those in the Lepidoptera. He referred more particularly to the tufts of hair in the mentum of *Trogosita*, and those on the ventral segments of the male of *Dermestes*. Differences in the vestiture of the sexes are known to occur, *e. g.*, *Hoplia*, where the male has scales and the females only hairs; but in this case it is hardly possible that we have to do with odoriferous organs.

ZOOLOGY.

MARKINGS OF ANIMALS.—Eimer has advanced the view that the markings on animals are primitively longitudinal stripes, which may subsequently be broken up to form dots, and these fuse to form transverse rings. This view is supported by the ontogeny of many animals. Dr. W. Haacke controverts this view from the study of an Australian fish, *Helotes scotus*. The adult fish is marked by eight longitudinal black bands; young specimens have in addition a row of clear transverse bands, which disappear when the fish attains to maturity.—*Journ. Roy. Micr. Soc.*, February, 1886.

BLIND CRABS.—Mr. J. Wood-Mason states that four species of Brachyura were dredged in the Bay of Bengal from depths exceeding 100 fathoms, during the past season, by H. M.'s Indian marine survey steamer *Investigator*. They belong to the genera *Amathia*, *Ethusa*, *Eucephaloides* (n. gen. allied to *Collodes* Stimpson) and *Lyreidus*, of which the last named (*L. channeri*) is especially interesting on account of the rudimentary condition of the eyes.

These organs are unequally reduced, the cornea of the left being of the normal form and extent, but opaque and devoid of all traces of facets, as in *Munidopsis*, *Orophorhynchus*, *Nephropsis* and other blind forms of the deep sea, while that of the right is entirely aborted, its place being only indicated by a small smooth spot marked out by the transparency of a lead-colored pigment similar to that which is seen through the integument around the base of the left eye. This interesting brachyuran, which is at once distinguished from the Japanese and American species by having the anterolateral margin of the carapace armed with two pairs of long and slender spines, were trawled up from a depth of 285–405 fathoms.—*Four. Roy. Micr. Soc.*, February, 1886.

THE INTERCENTRUM IN SPHENODON (HATTERIA).—Professor Cope, in his important note on this point (*AM. NAT.*, Feb., '86)

has shown that the intercentrum in *Sphenodon* is complete in the caudals; I can add that the same condition is to be found in the præcaudal vertebræ also. This makes Professor Cope's view of the *Embolomeri* being the batrachian type ancestral to the *Reptilia*, still stronger.

Fritsch¹ believes that he has found the representatives of the pleurocentra in the cervicals of a young *Sphenodon*; the præzygapophyses, he says, represent these elements; which are developed from a distinct point of ossification (according to Fritsch). I examined two *Sphenodons* in alcohol (one about 290^{mm} long). I could not find such a condition, and nobody will find it, not even in embryos. *Archegosaurus* has well developed præzygapophyses, *besides* the pleurocentra. In *no* vertebrate are the præzygapophyses developed from a distinct center; and *Sphenodon* makes no exception. The "centrum" of the vertebra in reptiles and mammals is formed by the pleurocentra; and embryology of the *Reptilia* will probably show that the centrum is developed from two lateral elements.—*Dr. G. Baur, March 23, 1886.*

ZOOLOGICAL NEWS.—*Mammalia*.—H. H. Johnson, in his work on the Kilimanjaro expedition, notes a singular resemblance (which some may call mimicry) between the aspect of the tall red-brown antelope, *Alcelaphus cokei*, and the mounds built by termites. The color being the same and the long grass hiding the animal's legs, it was really difficult to distinguish an antelope from an ant hill. The mimicry was sometimes made more ludicrously exact by the sharply pointed leaves of a kind of squill, which suggested the horns of an antelope.—F. W. True has described in a recent issue of the Proc. U. S. Nat. Mus. a new species of *Mesoplodon* (*M. stejnegeri*) obtained on Bering island by M. Stejneger. The species rests upon the characters of the cranium, quite badly water-worn, of a young individual. In general proportions it agrees with the skull of *M. hectori*, but the contour of the occipital, the section of the beak, etc., are different.—Mr. True pronounces the *Hyperoodon semijunctus* of Cope to be a *Ziphius*, distinct from *Z. cavirostris*. In the general form and proportion the skull approaches most closely to *Z. gervaisii*.—Sowerby's whale (*Mesoplodon bidens*) has been found upon the coast of Yorkshire. A male specimen fifteen feet nine inches long was left stranded in shallow water at the entrance to the Humber. Fourteen instances of the occurrence of this species on various parts of the European coast and one in North America (Nantucket, 1867) are enumerated (*Ann. and Mag. Nat. Hist.*, Jan., 1886).

Reptiles, etc.—Mr. A. B. Macallum (Quart. Journ. Mic. Soc., Nov., 1886), gives the following summary of the results of his

¹ Fritsch, A. Fauna der Gaskohle. Bd. II, Heft II, Prag, 1885.

studies of the nerve terminations in the cutaneous epithelium of the tadpole. Certain fibers, placed below the corium and known as the fundamental plexus, give origin to fibrils which enter the epithelium and end in comparatively large bead-like bodies between the cells, and may or may not branch, arise from a network of fine anastomosing nerve-fibrils situated immediately below the epithelium and forming meshes smaller than the space covered by an epithelial cell. One, commonly two, often three or more, nerve-fibrils terminate in the interior of each epithelial cell near its nucleus. The figures of Eberth are sheaths for intra-cellular nerve-terminations. — Colonel R. H. Beddome describes the earth snakes (Uropeltidæ) of India and Ceylon in a recent number of the *Annals and Mag. of Nat. Hist.* Six species of Rhinophis, one of Uropeltis, nineteen of Silybura, five of Plectrurus, one of Teretrurus (nov. gen.), three of Melanophidium, and three of Platyplectrurus are characterized. Several species are new.

Fishes.—*Nature* (Feb. 4, 1886) has an interesting article by A. Ernst upon the shoals of living and dead fishes which are cast upon the shore of Carupano, Venezuela. The place is celebrated for the occurrence of these shoals, which for the most part consist of small fishes, and are composed of several distinct species. The shoals are most common from May to November, during the rainy season, but in fine weather, when there is a moderate breeze from the sea. Sharks and other predatory fishes, as well as whales and sea-gulls, follow the shoal. The movement of the fishes is probably due to migration in search of food, the conformation of the coast at Carupano is such as to favor the embayment of the shoals at that point, and the death of the fishes is caused by submarine eruptions of gases. — T. J. Cunningham (Quart. Jour. Micr. Soc.) contributes observations upon the relations of the yolk to the gastrula in teleosts and other vertebrate types. At an average temperature of 7.5 C. whiting began to hatch on the tenth day, haddock on the eleventh. The fertilized ova of the cod, haddock and whiting are similar in all respects save size, while the ovum of *Trigla gurnardus* has a single large, brownish-yellow oil-globule. In the earlier condition of the periblast the cells of the blastoderm are continuous with it. The invaginated layer of the germinal ring is never continuous beneath the segmentation cavity, nor is it continuous with the periblast; it passes beneath the axis of the embryo, and from the first constitutes the dorsal hypoblast. The floor of the intestine is in all probability derived from the periblast. The whole edge of the blastoderm represents the ancestral blastopore, and the formation of the embryo by concrescence is simply the closing of the blastopore from before backwards. The edge of the blastoderm in Amphibia, Petromyzon and the ganoids is homologous with that of teleosts but not with that of elasmobranchs. The inflected part of this edge in the latter represents the whole of it in

the teleosteans. The ancestral part of the primitive streak in Sauropsida represents the ancestral blastopore, while the posterior part represents the coalesced uninflected part of the blastodermic rim in the elasmobranchs.—The fish fauna of Lake Balkhash, according to M. Nikolsky, numbers fourteen species, viz., *Perca schrenkii*, Phoxinus (two sp.), *Barbus platyrostris*, Schizothorax (five sp.), *Diptychus dibowskii* and three species of Diplophysa. All but one of these are new, and none are found either in the Aralo-Caspian basin or in the system of the Obi. Five genera are common to Lake Balkhash and the Central Asian lakes. In all these lakes Cyprinidæ and Cobitidæ predominate, and two species are common to Lob-nor and Lake Balkhash. Three species, the two Phoxini and the perch, are the only ones which ally the fauna of the latter lake to that of the Obi. From these facts M. Nikolsky concludes that if the depressions of the Alatau, Aral-Caspian and Siberia were ever a continuous marine basin, the first was separated earlier than the others.—Messrs. G. B. Goode and T. H. Bean describe sixteen new species of fishes (Proc. U. S. Nat. Mus., Oct., 1885) obtained by the U. S. Fish Commission mainly from deep water off the Atlantic and Gulf coasts. The species include five Heterosomata (Aphoristia two, Hemirhombus one, Citharichthys one, Etropus one), two species of Macrurus, one of Coryphænoides, one of Malococephalus, three of Bathgadus, one of Neobythites (nov. gen.), one of Porogadus (n. g.) and two of Bathyonus, which last name is a substitute for Bathynectes Gnthr., preoccupied in Crustacea.

Mollusks.—It appears from the experience of Mr. W. Armstrong and W. K. Brooks that seed oysters grow more rapidly and are of a better shape when placed on floating collectors than when deposited on the bottom. This is due to the absence upon these floating surfaces of the sediment which often forms a coat upon the bottom before the spat can become attached.—Those who wish to know how a list of species fares in the hands of one who critically republishes it, should look over the Report on the testaceous Mollusca obtained during a dredging excursion in the Gulf of Suez in the months of February and March, 1869, by Robert MacAndrew. Republished, with additions and corrections, by Alfred Hands Cooke (*Ann. and Mag. Nat. Hist.*, Feb. 1886).

Echinoderms.—M. G. Cotteau has put forth a preliminary but important paper upon the Eocene Echini of France, containing descriptions and figures of the species belonging to the genera Spatangus, Maretia, Euspatangus and Hypsospatangus.—Howard Ayers, as a result of studies of the structure and function of the Sphæridia of the Echinoidea, carried on at Banyul-sur-Mer (Quart. Jour. Micr. Soc., Nov., 1885), arrives at the conclusion that these organs possess the double function of taste and smell.

They are much more highly specialized than they are described by Loven to be, and have in fact a greater specialization of parts than can be seen in similar organs in the Medusæ. Sounds, which affect the spines and pedicellariæ immediately, are not noted by the sphæridia, which are first to recognize the presence of a drop of acetic acid in the water.—Mr. R. Rathbun (Proc. U. S. Nat. Mus.) contributes a report upon the Echini collected by the U. S. steamer *Albatross* in the Gulf of Mexico from January to March, 1885. Thirty-one species were collected in suitable condition for determination. These represent seventy-eight dredging stations in from twenty-one to 1330 fathoms, only one species having been obtained in shore collecting. Seventeen species were additional to those obtained in 1884, yet nine species of that date were not found in 1885.

Worms.—Dr. von Linstow (Zeit. f. wiss. Zool.) enumerates fourteen courses of development known among Nematelminths, according to the medium in which they develop. (1) Some genera pass directly into an adult form; (2) the larvæ live in the earth, the adults in plants; (3) the larvæ live in worms, and on their death pass into the earth and become adult; (4) in *Sphærolaria bombi* the adults live in the earth, and the fruitful females enter the bodies of bees and there reproduce; (5) the larvæ live in the earth, the adults in some animal; (6) the hermaphrodite worm lives in some animal, while the offspring develops into bisexual forms in the earth; (7) some adults are free-living and sexual, others hermaphrodite and parasitical on animals; (8) the larvæ hatch in the earth and develop into hermaphrodite forms in animals; (9) the larvæ live in insects, the adults in earth or water; (10) the larvæ live encapsuled in one animal, and with it pass into the digestive system of another animal and become adult; (11) the hermaphrodite form lives a short time in the intestine of some animal and here produces a larva which becomes encapsuled in the muscles; (12) the adults live in the tracheæ of birds, the embryos are expectorated, swallowed with the bird's food, hatch out in the crop and œsophagus, wander into the bronchiæ and air-sacs, and thence to the tracheæ (*Syngamus trachealis*); (13) Gordius has two larval forms, one in beetles the other in mollusks, while the adults live in water; (14) of two larval forms one is aquatic, while the other inhabits the lung of an amphibian and passes thence into the intestine of the same animal where it develops into the hermaphrodite form. This is the case with *Nematoxis longicauda*, the last form of which is described and figured by Dr. Linstow.—The annelid, *Siphonostoma diplochætus*, according to M. Et. Jourdain, has two pairs of true eyes provided with a refringent body analogous to that present in tunicates, and traversed with radiating striæ. This worm is common in the mud near Marseilles, and is covered with a very thick coat of mucus derived from two types of papillæ,

the one ovoid, as it were, isolated in the mucus and formed of glandular cells similar to those which enter into the structure of the epidermis, the other fusiform and with filaments at their extremity. The papillæ are joined to the body by long and slender peduncles. — F. E. Beddard (*Ann. and Mag. Nat. Hist.*, Feb., 1886) describes three species of *Perichæta* and one of *Moniligaster* from Ceylon and the Philippines. The latter genus is remarkable for the apparent absence of a clitellum and the presence of five distinct gizzards in the œsophagus.

Protozoa.—A. C. Stokes (*Ann. and Mag. Nat. Hist.*) describes several New Infusoria from American fresh waters. — H. J. Carter describes in the January and February numbers of the *Ann. and Mag. of Nat. Hist.*, thirty-five species of sponges from the neighborhood of Port Phillip heads, South Australia.

EMBRYOLOGY.¹

ON THE SYMMETRY OF THE FIRST SEGMENTATION FURROWS OF THE BLASTODISK OF ELASMOBRANCHII.—The nearly symmetrical subdivision of the blastodisk of Teleosts by the first four segmentation furrows has long been known. The details of the early development of the blastodisk of Teleosts have been very carefully elaborated by Agassiz and Whitman,² whose conclusions are, I believe, generally accepted by embryologists. Of the development of the blastodisk of Elasmobranchs we know comparatively little, especially in relation to the relative position and direction of the first segmentation furrows. The object of the present note will therefore be to describe the early segmentation of the blastodisk of one of the latter, viz., *Raia erinacea*, as displayed by an egg removed from the oviduct and cloaca of a female of that species, July 11, 1885, at Wood's Holl, Mass.

Upon opening the tough horny membranous envelope in which the ovum proper of *Raia* is enclosed, it is found that the egg is somewhat pinkish in color, and is imbedded in a layer of very glairy "white" or albumen, which fills up the space between the egg and the horny case. The pinkish egg proper is somewhat flattened and oval in shape, and is immediately invested by a very thin and delicate vitelline membrane. At one side of the flattened vitellus, which measures nearly one and a quarter inches through its longest diameter, a small circular whitish area about two millimeters in diameter is noticeable. This is the blastodisk or germinal area of authors, and is the point where development first begins to manifest itself.

If the egg case is carefully opened, the white removed and then laid into a one per cent solution of chromic acid, the blasto-

¹ Edited by JOHN A. RYDER, Smithsonian Institution, Washington, D. C.

² On the development of some pelagic fish-eggs. *Proc. Am. Acad. Arts and Sci.*, xx, 1884.